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STATEMENT WATER QUALITY MANAGEMENT AND POLLUTION CONTROL PROGRAM IN IOWA, KANSAS, MISSOURI, AND NEBRASKA. VOLUME I, TEXT

Public Health Service
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STATEMENT

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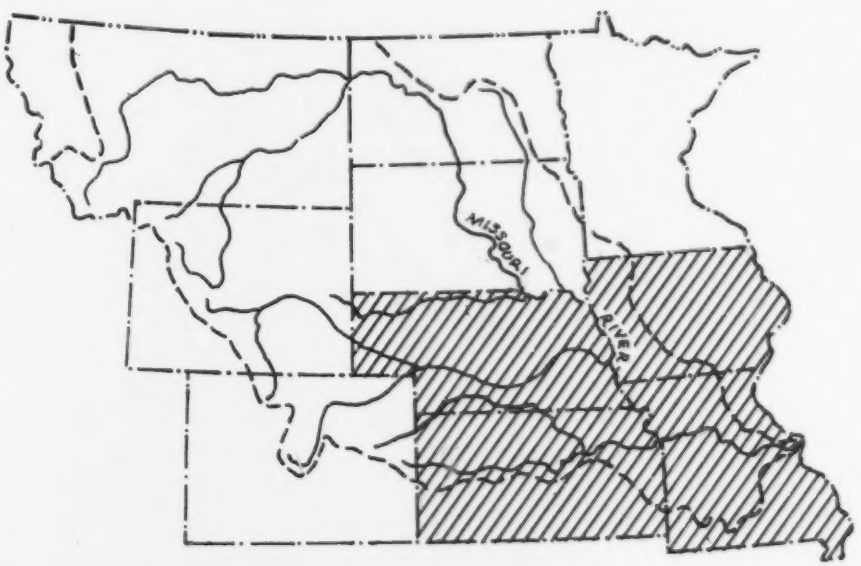

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v. 3 Appendix C, Construction grants; Appendix D, Enforcement; Appendix E, Federal installations. cover title, [251] p. 4°

STATEMENT
WATER POLLUTION AND QUALITY MANAGEMENT PROGRAMS
OF THE
STATES OF IOWA, KANSAS, MISSOURI, AND NEBRASKA

by
Division of Water Supply and Pollution Control
Public Health Service
U. S. Department of Health, Education, and Welfare
Region VI
Kansas City, Missouri

Presented before the
Natural Resources and Power Subcommittee
of the
House Committee on Government Operations
Kansas City, Missouri
May 22-23, 1964

STATEMENT WATER POLLUTION CONTROL AND QUALITY
MANAGEMENT PROGRAMS FOR IOWA, KANSAS, MISSOURI AND NEBRASKA

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INTRODUCTION

I. INTRODUCTION

THE REPORT

This report of Water Quality Management and Pollution Control Programs in Iowa, Kansas, Missouri, and Nebraska has been prepared in response to a request from the Natural Resources and Power Subcommittee of the House Committee on Government Operations. In general, it outlines activities and plans of the Public Health Service of the U. S. Department of Health, Education and Welfare as carried out through the Region VI office with Headquarters in Kansas City, Missouri.

In preparation of the report, use has been made of readily available information, including information pertaining to recent and current operations of the program. The report is not exhaustive in its treatment of the subject, nor does it cover in detail all activities of the Federal Water Pollution Control Program. Relatively little emphasis, for example, is given to such activities as public awareness and information programs and activities which are directed toward encouraging enactment of uniform State laws.

Briefly, this report includes a description of the Four-State area referred to above; a summary of Water Resources Activities; Water Quality and Basic Data and their interpretation; Construction Grants Activities; Enforcement actions and a description of activities concerning waste discharges from Federal installations.

THE OVERALL WATER QUALITY AND POLLUTION CONTROL PROBLEM

Within the Four-State area covered by this report, there are water quality problems in connection with both ground and surface waters. In large measure, the surface water quality problems center around both natural and man-made pollution. Natural pollution for the most part is caused by drainage from salt deposits and silt from erosion in tributary basins, as well as along the main stem of the Missouri River. Man-made pollution for the most part is from municipalities and industries including wastes from oil producing fields. Man-made pollution problems are in areas of high population and/or industrial concentration.

Ground water quality in many parts of the Four-State area is not satisfactory for domestic use without treatment for mineral removal.

Noteworthy progress has been made during the past ten years toward abatement of pollution in the area. In 1953, the Missouri Basin States and the Public Health Service jointly developed a "Comprehensive Program for Control of Pollution in the Missouri Drainage Basin." This cooperative State-Federal report on water pollution control has been the basis for an effective and progressive pollution abatement program throughout the Basin. The Comprehensive Program has served as a guide for State and Federal activities toward pollution abatement.

COOPERATIVE WORK WITH STATES

The Federal Water Pollution Control Act authorizes research, enforcement,

and technical assistance in supporting and strengthening State and local activities. Section III of the Act authorizes and directs the Secretary of Health, Education and Welfare to encourage cooperative activities by the States for prevention and control of water pollution. The Public Health Service recognizes the fact that only through cooperative participation by Federal, State and local governments and by industry can a completely effective water pollution control program be carried out. In working with the four States since the Federal Water Pollution Control Act was first passed in 1948, there has been continuous recognition of the fact that there is a critical shortage of professional and scientific personnel assigned by the States to Water Pollution Control activities. This shortage is due basically to the lack of sufficient supporting funds and to low salary scales. This shortage of manpower is becoming increasingly serious especially in the face of the growing complexity of water pollution control problems and increasing competition for technical personnel.

The State Water Pollution Control agencies have expressed a willingness to assist the Public Health Service in compiling an industrial waste inventory. It is the feeling of the State Agencies that industry will be willing to assist in developing data and providing information for such an inventory. Industries have indicated by their actions in this area a desire and willingness to take necessary steps toward corrective action on water pollution matters.

In addition to cooperative action with State water pollution control agencies, action is also taken to coordinate efforts in this area with other Federal agencies involved in water and related land resources development activities.

Under Section 4 of the Federal Water Pollution Control Act, the Public Health Service has worked with these Four States to encourage, cooperate with, and render assistance to the State Water Pollution Control agencies, Universities, and other agencies to conduct, promote, and coordinate research and investigations and studies relating to the cause, control, and prevention of water pollution. Cooperative effort in stimulating and providing training in technical matters and supplying available information and data has received considerable emphasis.

Under Section 5 of the Federal Water Pollution Control Act, program grants are made to the State and interstate agencies to assist them in meeting the costs of establishing and maintaining adequate measures for the prevention and control of water pollution. Program grants for Fiscal Year 1964 were: Iowa - $69,900; Kansas - $54,500; Missouri - $95,600; Nebraska - $40,300.

The construction grants activities in these four States have been very effective in helping municipalities meet the problem of providing sewerage facilities, including treatment plants for water pollution control. Excellent working relationships prevail between the Public Health Service and the State Water Pollution Control Agencies in the administration of these activities.

PHYSICAL CHARACTERISTICS

The Four-State area covered by this report is drained for the most part by the Missouri River and its tributaries from the Niobrara River to the Mississippi. Major tributaries entering this reach include the Niobrara, James, Big Sioux, Little Sioux, Elkhorn, Platte, Kansas, Grand, Chariton, Osage, and Gasconade Rivers. The southern half of Kansas is drained by the Arkansas River system.

Topography

The main stem of the Missouri River in this Four-State area flows through the dissected till plains of the central lowlands, except for the reach from Kansas City to near St. Charles, Missouri, where it flows along the north border of the Osage Plains and the Ozark Plateau. The central lowlands are roughly rolling, becoming more rugged to semi-mountainous in the Ozark Plateau areas. Elevations of the main stem vary from about 2,000 feet near Sioux City to about 400 feet at the mouth. Elevations in western Kansas and Nebraska reach 3,000 to 4000 feet.

The Missouri in this reach is characterized by high sediment concentration and flows through a wide, easily eroded, alluvial valley. Above Sioux City, the hills are about 17 miles apart, narrow to about 3 miles at Omaha, widen to 8 miles at Nebraska City, and close to 2 miles at Kansas City. At Waverly, Missouri, the valley is about 8 miles from bluff to bluff, narrowing to 2 miles just below Glasgow, Missouri, and then continuing from one and one-half to 3 miles wide to the mouth.

The river slope is not uniform; in the 380 miles from the mouth to Kansas City, the average drop is 0.82 feet per mile; from Kansas City to Sioux City (380 miles) 0.93 feet per mile; and from Sioux City to the junction with the Niobrara River (125 miles) 1.02 feet per mile. The average slope over the 885 miles is 0.92 feet per mile. Local slopes as flat as 0.43 feet per mile in a one mile reach, and as great as 1.87 feet per mile in a one and one-half mile reach, have been observed in the section between Omaha and the mouth of the Nishnabotna River.

The Missouri flows over a variety of geological formations in this reach, beginning with beds of the Cretaceous age at a point near Onawa, Iowa, where it crosses Pennsylvania strata to a point near the mouth of the Grand River. Then it enters a belt of Mississippian rocks which give way to earlier Paleozoic rocks near Columbia, Missouri. Passing across these the river comes into a somewhat higher stratigraphic position and for a short distance above its mouth, again flows through a valley cut in rocks of the Mississippian age.

Topography along most tributaries consists of undulating to rolling uplands with occasional ridges and low hills. Limited areas along some drainage channels are rough and broken. The bottom lands are usually broad and flat and well suited to cultivation or pasture. The channel slopes of tributaries vary from quite steep to fairly flat.

Climate

The climate ranges from subhumid in the northwestern to humid in the southern and eastern portions of the Basin. Average annual precipitation varies quite uniformly from about 24 inches per year in southeastern South Dakota to 40 inches per year in Missouri. Well over half of the yearly precipitation occurs during the growing season, which varies from 190 days in Missouri to 140 days in southwestern Minnesota.

The average annual temperature is from 47° F. in the north to 55° F. in the south. The northern portion has an average January temperature of 14° F. and an average July temperature of 72° F., with extremes of 115° F. and -40° F. having been recorded. In the southern sections the average January and July

temperatures are 30° F. and 78° F. respectively, with extremes of 110° F. and -30° F. having been reached.

Hydrology

The Missouri is characterized by wide variations in seasonal flows. The winter season is the period of low flow, with significant ice cover from December to February extending as far south as Kansas City. The first rise usually occurs during April following melt of the snow blanket over the interior plains. The June rise is usually much greater and results from snow melt in the higher plateaus and mountains combined with spring rainfall in the lower basin. Following the June rise, low water prevails throughout the summer and early autumn with occasional rises caused by heavy rains. Increased flow in late autumn results from widespread precipitation. Average runoff from the Lower Missouri drainage area varies from one inch in the upper portion to over 10 inches near the mouth.

ECONOMIC CHARACTERISTICS

The early economy of the Four-State area was based principally on agriculture and its related endeavors. During the past ten years, there has been a rapid change to a predominate manufacturing economy and a more efficient agricultural economy.

Population

The enumerated population (U.S. Department of Commerce, Bureau of the Census) of the Four-State area in 1960 was 10,667,291, approximately six percent of the total United States population. The ratio of area population to national population decreased between 1950 and 1960 because of the slower growth rate in the Four-State area. Out-migration has been principally responsible for this decreasing ratio.

Urban population in the Four-State area has increased, while the rural population decreased. In 1940, 46 percent of the total population was defined as urban, in 1960 this percent increased to 57, indicating a migration to the urban areas.

Population projections presented in Outdoor Recreation Resources Review Commission (ORRRC) Study Report 23, Tables A-2 and A-10, estimate the population of the Four-State area will increase by nearly 18 percent or to 12,580,000 by 1976 and by another 40 percent or to 17,624,000 by the year 2000. These projections indicate that the rate of growth in the Four-State area would continue to be somewhat slower than for the Nation as a whole. The percentage ratio of the Four-State area to the national population is expected to decrease from 5.95 in 1960 to 5.47 in 1976 and 5.03 in 2000. The following table depicts population data from Tables A-2 and A-10 of ORRRC Study Report 23.

Population, Current and Projected
for the Four-State Area and the United States
(in thousands)

Area	Actual 1960	Projected 1976	Projected 2000
United States	179,323	230,019	350,477
Iowa	2,758	3,266	4,514
Kansas	2,179	2,592	3,727
Missouri	4,320	5,003	7,015
Nebraska	1,411	1,719	2,368
TOTAL	10,668	12,580	17,624
Percent of U.S.	5.95	5.47	5.03

Labor Force and Employment

The total civilian labor force reported by the Bureau of Census for 1960 totaled 4,048,308 for the Four-State area and 68,144,079 for the United States. The unemployment in the Four-State area averaged 3.6 percent in 1960. Missouri had the highest rate of unemployment at 4.1 percent, while Nebraska had the lowest rate at 3.1 percent. During the same period, the United States rate was 5.1 percent.

In 1960, approximately 14 percent of the total labor force in the Four-State area was employed in agriculture. Iowa and Nebraska had the highest rate employed in agriculture in the Four-State area, both employing about 20 percent of the total labor force; Kansas employed about 13 percent, while Missouri, with the lowest rate employed about nine percent. During the same period, the United States as a whole employed 6.1 percent of the labor force in agriculture.

In 1960, manufacturing employed about 19 percent of the total labor force in the Four-State area. Missouri had the highest rate employed in manufacturing at about 24 percent, while Nebraska had the lowest rate at 12 percent. Manufacturing in the United States as a whole employed about 25 percent of the labor force in 1960.

Projections from ORRRC Study Report 23 projects a total employment in the Four-State area to 5,040,000 in 1976, with a corresponding employment of 90,100,000 for the Nation as a whole. Agriculture's share of employment is projected to decrease to about 11 percent for the Four-State area and five percent for the Nation. The following table depicts actual and projected employment by States and for the U. S. by major categories (data source: ORRRC Study Report 23, Tables F-8, 9, and 10).

Employed Persons, Actual 1957 and Projected 1976
(in thousands of employees)

Area	All Employees		Projections by Industry Groups to 1976			
	Actual 1957	Projected 1976	Commodity Employment			
			Agr.	Mining	Mfg.	Non-commodity
U.S.	64,960	90,100	4,560	680	21,150	63,710
Iowa	965	1,254	212	2	215	826
Kansas	753	980	93	14	177	697
Missouri	1,704	2,156	169	6	474	1,515
Nebraska	542	650	99	2	95	453
TOTAL	3,964	5,040	564	24	961	3,491
Percent of U.S.	6.10	5.59	12.37	3.53	4.54	5.48

Agriculture

Although the number of farms and farmers have declined within the Four-State area during the past decade, and are expected to continue to decline somewhat more slowly into the future, agriculture is expected to continue to be an important segment of the economy in the future.

There were 538,201 farms in the Four-State area in 1959 averaging about 350 acres in size which produced an average gross value product of about $10,400 per farm. About 70 percent of the gross product came from the sale of livestock and livestock products. The total value of farm products continues to increase despite the decline in the number of farms and acres of cropland harvested. This increase was accomplished through improved farm technology and farm consolidation.

Acres of land irrigated in the Four-State area increased from 1,018,420 in 1949 to 2,888,165 in 1959. Nebraska was the leading State in the area with slightly over 2 million acres in irrigated land. Further increases in irrigated land are expected in the future with Nebraska and Kansas continuing to be the leading irrigated States in the area.

Forestry

Approximately 11 percent of the total land within the Four-State area was classified as forest land in 1953. (The latest available data. Source: "Timber Resources for America's Future," Forest Service, U.S.D.A., Forest Resource Report No. 14, January 1958.) This compares with 34 percent for the United States. The Four-State area had about 10 percent of the United States' land area, but only about three percent of the Nation's forest land. Missouri is the leading State in the area with approximately 75 percent or 15,177,000 acres of forest land.

Mining

Measured in terms of dollar value, the Four-State area produced about

five percent of the Nation's minerals in 1960 (value of mineral production in the area totaled $838,708,000 with Kansas the leading State with over 50 percent of the total). The principal minerals produced in the Four-State area are: (1) Petroleum (2) Cement (3) Natural Gas (4) Stone (5) Sand and Gravel, and (6) Lead, in order of economic importance.

Manufacturing

In 1960, the food and kindred products category made up the largest number of employed persons in the manufacturing category. This employment was well distributed among the Four-State area. Manufacturing employment in 1960 is listed in order of importance by States: 1. Iowa - Food and Kindred (55,624), Machinery, except electrical (34,801); 2. Kansas - Transportation Equipment (33,472), Food and Kindred (22,574); 3. Missouri - Food and Kindred (53,731), Apparel and other Fabricated Textiles (30,468); 4. Nebraska - Food and Kindred (26,624), Printing and Publishing (7,185).

Electric Power

The Four-State area had about 8,219,000 kilowatts of installed generating capacity in 1960. Of this total, 92 percent was classified as fuel being the type of prime mover, while the remaining eight percent classified hydro as the prime mover. The Four-State area had about four percent of the Nation's total installed capacity and only two percent of the Nation's hydroelectric kilowatt hours.

Fish and Wildlife

The fisheries and wildlife resources of the Four-State area are valuable for both recreational and commercial purposes. From the fishing and hunting standpoint, the area is regarded as one of the best in the Nation. Expenditures totaling millions of dollars are made by both residents and tourists pursuing these sports.

Outdoor Recreation

The scenic resources of the Four-State area are outstanding. The varied recreational opportunities afforded by lakes, mountains, rivers, and many preserved historical sites are considered to be one of the principal amenities of the area. In addition to providing recreation for the region's residents, these resources have great economic value in attracting a substantial tourist industry.

Projections of Economic Indicators

Gross product, personal income, and disposable personal income were shown for 1957 and projected to 1976 by States and for the Nation for the Outdoor Recreation Resources Review Commission in ORRRC Study Report 23. These data are presented in the following table.

Economic Indicators by States for the
Four-State Area and for the United States
1957 and Projected to 1976
(in billions of 1959 dollars)

Area	Gross Product		Personal Income		Disposable Personal Income	
	1957	1976	1957	1976	1957	1976
U. S.	455.10	1,011.90	359.54	803.00	316.00	702.50
Iowa	6.68	13.14	5.27	10.68	4.74	9.27
Kansas	4.94	10.94	3.96	8.84	3.55	7.81
Missouri	11.03	23.83	8.57	19.02	7.60	16.77
Nebraska	3.48	6.46	2.72	5.20	2.48	4.58
TOTAL	26.13	54.37	20.52	43.74	18.37	38.43
Four-State Area as Percent of U.S.	5.74	5.37	5.71	5.45	5.81	5.47

These data indicate that significant growth is expected in the Four-State area; however, the Four-State area's comparative position to the Nation may decrease slightly.

THE AREA'S WATER RESOURCES

The Four-State area of Iowa, Kansas, Missouri, and Nebraska comprises about eight percent of the Nation's total area (including Alaska and Hawaii). The Four-State area has an average annual rainfall ranging from 40 inches in Missouri to 22 inches in Nebraska. The average annual runoff in the Four-State area ranges from less than one inch in the western sector to slightly more than ten inches in the eastern sector. The area is traversed by three of the major rivers in the United States (Mississippi, Missouri, Arkansas), part of which are navigable.

Estimates of developed and undeveloped water power, in terms of electric power, by States and for the United States is shown in the following table.

Water Power - Developed and Estimated Undeveloped, 1960 [1/]
(in thousands of kilowatts)

Area	Developed	Undeveloped
U. S.	33,092	114,200
Iowa	136	500
Kansas	6	300
Missouri	293	2,800
Nebraska	240	700
TOTAL	675	4,300
Four-State area as Percent of U. S.	2.0	3.8

The preceding data indicates significant undevelopment of water power in the Four-State area with only about 15 percent of the potential developed.

The potential water resources in the area for such uses as power, municipal and industrial water supplies, irrigation, fish and wildlife, outdoor recreation and other purposes indicate a most promising future.

[1/] Source: Statistical "Abstract of the United States" 1962, Department of Commerce, Bureau of the Census

II. WATER RESOURCES

AUTHORITY

The Federal Water Pollution Control Act Amendments of 1961 (P.L. 87-88) authorizes the provision of storage in Federal reservoirs for the regulation of river flows for pollution abatement purposes and directs Federal agencies planning and constructing such reservoirs, to seek the advice of the Secretary of Health, Education and Welfare regarding the need for and the value of such storage.

Title III of P.L. 85-500 (Rivers and Harbors and Flood Control Act of 1958) provides for the inclusion in Corps of Engineers and Bureau of Reclamation reservoirs for storage for municipal and industrial water supply, under certain terms and conditions of reimbursement. Under a Memorandum of Agreement between the Secretaries of the Army and Health, Education, and Welfare negotiated in November 1958, the Corps of Engineers utilizes the services of the Public Health Service in determining (1) the need for and amount of storage required for municipal and industrial water supply, and (2) the value of such storage.

In May 1954, the Inter-Agency Committee on Water Resources was established to provide improved facilities and procedures for the coordination of the policies, programs, and activities of the signatory agencies in the field of water and related land resources development. The signatory agencies to this agreement were the Departments of Interior, Agriculture, Commerce, Health, Education, and Welfare, Army, and the Federal Power Commission. Under this agreement, the reports of each of the agencies are reviewed by the other agencies at the field and headquarters level and comments provided on the effects of proposed works and programs on each of the respective agency's interests.

The Division of Water Supply and Pollution Control of the Public Health Service has been given the specific responsibility of meeting HEW's commitment in each of these special study areas.

STREAMFLOW REGULATION FOR QUALITY CONTROL

Streamflow regulation is one of the three basin methods used in maintaining water quality. The other two are: Elimination of waste at its source, and treatment of waste water to remove pollutants.

Obviously, the most effective quality control measure is to exclude or eliminate harmful substances and keep them from entering sewage or industrial waste water. Not only is this the most effective method of water quality control, but in many cases it is the most economical.

Collection and treatment of wastes at the source is the main line of action in the Federal campaign against water pollution. Public policy generally precludes any person or organization the right to pollute surface and ground waters and requires that each water user provide adequate treatment to remove pollutants before waste water is discharged.

Streamflow regulation for quality control is the third, but equally important, line of action. Even after application at the source of the best waste

treatment practices presently known, some pollutants still enter the stream. These residual pollutants can cause adverse conditions in the receiving waters during critical streamflow conditions. Furthermore, many streams are polluted from non-point sources such as urban and rural runoff for which there is yet no practical means of elimination or treatment.

Recognizing the above need, the Federal Water Pollution Control Act was amended in 1961 to authorize consideration of storage for streamflow regulation for water quality control in all Federal reservoirs. As provided for in the Act, the need for and value of water quality storage is determined by the Federal Construction agencies such as the Corps of Engineers and the Bureau of Reclamation, with the advice of the Secretary of Health, Education and Welfare. The Division of Water Supply and Pollution Control carries out this responsibility.

While the scope and extent of the Public Health Service investigations vary from project to project, they generally contain three elements: The need for storage defined in terms of releases needed for regulation; the value of storage described in terms of intangible as well as direct dollar benefits; and the identification of beneficiaries of such storage. Where the benefits are widespread or national in scope, water storage quality control may be provided on a non-reimbursable basis.

These determinations of needs for and value of storage for streamflow regulation for quality control are made to cover the life of the project which is usually taken as 50 or 100 years. Therefore, economic studies of the project area as well as engineering studies are made to arrive at the determinations of water quality storage needs.

MUNICIPAL AND INDUSTRIAL WATER

The basis for including water supply storage in Federal projects, and the requirements for reimbursement of the costs thereof, are specifically prescribed in P.L. 500-85th Congress. Basically, Federal construction agencies are required to consider obvious long-term needs for maximum utilization of the available water resources in the planning and construction of multipurpose reservoir projects.

By Memorandum of Agreement between the Department of the Army and the Department of Health, Education, and Welfare, the Public Health Service renders assistance to the Corps of Engineers in the implementation of the provisions of the 1958 Act. Specifically, the Public Health Service provides the Corps with a determination of the present and future (the life of the project, usually 50 or 100 years) needs for an economic value of municipal and industrial water uses which might be supplied from the Corps of Engineers reservoirs. These determinations involve both engineering and economic investigations in determining the need for and value of water storage for municipal and industrial water. Both quantity and quality of the water is considered in determining the most feasible source of municipal and industrial water supply.

WATER RESOURCE STUDIES

Table No. 1 shows Water Resource studies that are completed, under study, or planned by Public Health Service, Region VI, in the States of Iowa, Kansas, Missouri and Nebraska.

The reports listed under "Completed Studies" have been submitted to the respective agencies (Corps of Engineers or Bureau of Reclamation). The "Under Study" projects are presently being investigated, and the "Planned" projects are those that will be studied at a later time.

Table No. 1

Water Resource Studies

Study	State(s)	Basin	Status
Big Hill Creek (C)	Kansas	Verdigris	Completed
Cedar Rapids Div. (B)	Nebraska	Cedar River	Completed
Chariton-Little Chariton River Basin (C)	Iowa-Missouri	Chariton & Little Chariton Rivers	Completed
Des Moines River (C)	Iowa	Des Moines River	Completed
Eldorado, Douglass & Towando (C)	Kansas	Walnut River	Completed
Eleven Point Reservoir (C)	Missouri-Arkansas	Eleven Point	Completed
Fishing River (C)	Missouri	Fishing River	Completed
Grand "Neosho" & Cottonwood Rivers(C)	Kansas-Oklahoma-Missouri	Grand River	Completed
Grand River Basin (C)	Iowa-Missouri	Grand River	Completed
Kaysinger Bluff Dam & Reservoir (C)	Missouri	Osage River	Completed
Little Blue Unit (Angus Reservoir) (B)	Nebraska-Kansas	Little Blue River	Completed
Marion & Cedar Point Reservoir (C)	Kansas	Cottonwood River	Completed
Marmaton River Basin (C)	Kansas-Missouri	Marmaton River	Completed
Meramec River Basin (C)	Missouri	Meramec River	Completed
O'Neill Project (C)	Nebraska	Niobrara River	Completed
Perry Reservoir Project (C)	Kansas	Delaware River	Completed
Platte River Basin (C)	Iowa-Missouri	Platte River	Completed
Round Mound Dam & Reservoir (B)	Kansas	Smoky Hill River	Completed

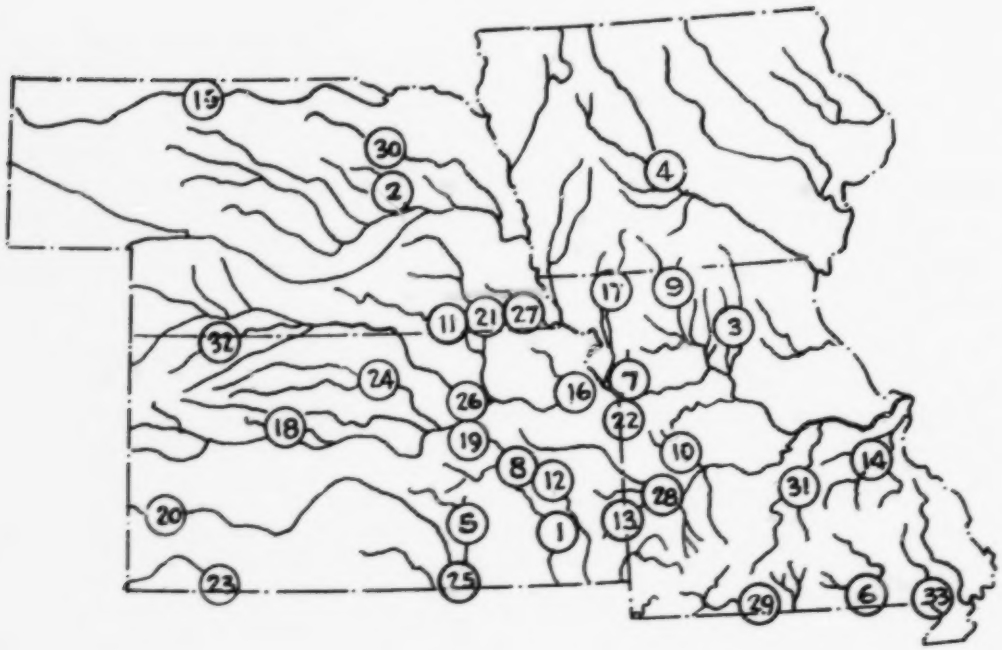
Table No. 1

Water Resource Studies
(cont'd)

Study	State(s)	Basin	Status
Woodbine Reservoir (C)	Kansas	Lyon Creek	Completed
Arkansas River Subbasin, Kansas & Colorado (C)	Kansas-Colorado	Arkansas	Under Study
Big Blue River Basin (B)	Nebraska-Kansas	Big Blue River	Under Study
Big Blue River Basin (Blue Div.) (C)	Nebraska-Kansas	Big Blue River	Under Study
Blue River Basin (C)	Kansas-Missouri	Blue River	Under Study
Cimarron River (C)	Kansas-Oklahoma	Cimarron River	Under Study
Glen Elder Unit (B)	Kansas	Solomon River	Under Study
Kaw Reservoir (C)	Kansas-Oklahoma	Arkansas	Under Study
Milford Reservoir Project (C)	Kansas	Kansas River	Under Study
Nemaha River Basin (C)	Nebraska-Kansas	Nemaha River	Under Study
Osage River Basin (C)	Kansas-Missouri	Osage River	Under Study
White River (C)	Missouri-Arkansas	White River	Under Study
Elkhorn River Basin (B)	Nebraska	Elkhorn River	Planned
Gasconade River & Tributaries (C)	Missouri	Gasconade River	Planned
Nelson-Buck Unit (B)	Colorado-Nebraska-Kansas	Beaver Creek	Planned
St. Francis River (C)	Missouri-Arkansas	St. Francis River	Planned

(C) Corps of Engineers Projects
(B) Bureau of Reclamation Projects

LOCATION MAP SHOWING WATER RESOURCE STUDIES



No.	Name	Status*	No.	Name	Status
1	Big Hill Creek	C	16	Perry Reservoir Project	C
2	Cedar Rapids Division	C	17	Platte River Basin	C
3	Chariton-Little Chariton River Basin	C	18	Round Mound Dam & Res.	C
4	Des Moines River	C	19	Woodbine Reservoir	C
5	Eldorado, Douglass and Towando	C	20	Arkansas River Subbasin, Kansas & Colorado	U S
6	Eleven Point Reservoir	C	21	Big Blue River Basin (Blue Division)	U S
7	Fishing River	C	22	Blue River Basin	U S
8	Grand "Neosho" & Cottonwood Rivers	C	23	Cimarron River	U S
9	Grand River Basin	C	24	Glen Elder Unit	U S
10	Kaysinger Bluff Dam and Reservoir	C	25	Kaw Reservoir	U S
11	Little Blue Unit (Angus Reservoir)	C	26	Milford Reservoir Project	U S
12	Marion & Cedar Point Res.	C	27	Nemaha River Basin	U S
13	Marmaton River Basin	C	28	Osage River Basin	U S
14	Meramec River Basin	C	29	White River	U S
15	O'Neill Project	C	30	Elkhorn River Basin	P
			31	Gasconade River & Trib.	P
			32	Nelson-Buck Unit	P
			33	St. Francis River	P

*C - Completed
U S - Under Study
P - Planned

SOIL CONSERVATION SERVICE PROJECTS

The following steps are carried out for a review of a Soil Conservation Service Watershed Project developed under Public Law 566:

1. Upon receiving authorization to prepare a watershed work plan, the SCS State Conservationist submits three copies of a "Preliminary Investigation Report" together with three copies of a "Work Outline" (including maps showing locations of proposed structures) to the Public Health Service Division of Water Supply and Pollution Control, with a request that the health agencies submit an evaluation report on the proposed project.

2. The Division of Water Supply and Pollution Control forwards copies of these documents to the appropriate State Health Department and the State Aids Section, Communicable Disease Center, Greeley, Colorado, with a request that the necessary reviews and investigations be made for the proposed project.

3. A vector evaluation report, including control recommendations, is prepared jointly by personnel of the State Aids Section and the State Health Department. The State Aids Section submits the joint vector evaluation report to the Water Supply and Pollution Control office.

4. The Water Supply and Pollution Control office consolidates the vector evaluation report and those comments pertaining to other public health problems into a single report to the State Conservationist, at which time copies of the consolidated report and letter of transmittal are sent to the State Aids Section office and the State Health Department.

5. The State Conservationist provides the sponsoring organizations with copies of the public health report.

Table No. 2 shows the Soil Conservation Service Projects that have been reviewed by the Public Health Service, Region VI in the States of Iowa, Kansas, Missouri, and Nebraska.

Table No. 2

Soil Conservation Service Projects
Reviewed by PHS, Region VI

WATERSHED PROJECT	COUNTIES
Iowa	
Badger Creek	Madison, Dallas, Warren
Beaver	Webster
Bee-Jay	Pottawatomie
Big Creek	Decatur
Big Park, Indian Creek Picayune Creek	Pottawatomie, Crawford
Big Wyacondah	Davis
Blockton	Taylor
Chippewa Creek	Wapello
Crooked Creek	Audubon, Cass, Guthrie
Davids Creek	Audugon, Guthrie
Davis-Battle	Monona
Deer Creek	Worth
Diamond Lake	Poweshiek
English Bench	Allamakee
Gant Creek	Plymouth
Hamburg	Fremont
Harmony Creek	Harrison
Held	Plymouth
Hound Dog Creek	Fremont
Mil Picayune	Crawford, Harrison, Shelby
Moulton	Appanoose
Pierce Creek #1	Page
Pony Creek	Mills, Pottawatomie
Red Oak Creek	Montgomery
Rocky Branch Creek	Jefferson
Ryan-Henschal Creek	Pottawatomie
Simpson Creek	Fremont
South Hungerford #2	Plymouth
Stennett Creek-Red Oak	Montgomery
Three Mile Creek	Union, Adair
Turkey Creek	Adair, Audubon, Cass, Guthrie
Walter's Creek	Adams

Table No. 2

Soil Conservation Service Projects
Reviewed by PHS, Region VI
(cont'd)

WATERSHED PROJECT	COUNTIES
Kansas	
Andale	Sedgwick, Rent
Bee Creek	Chautauqua, Montgomery
Big Caney	Elk, Cowley
Big Creek	Allen, Neosho
Cimarron	Gray
Clear Creek-Upper and Lower Big Stranger Creek	Atchison, Jefferson, Leavenworth
Elk Creek	Jackson, Atchison, Nemaha
Fall River	Greenwood, Butler, Chase
Frog Creek	Coffey, Chase
Goose Creek	Reno, Kingman
Grant-Shanghai Creek	Chautauqua
Grasshopper-Coal Creek	Brown, Atchison, Jefferson
Gypsum Creek	Saline, McPherson, Marion, Dickinson
Humboldt Creek	Gary, Morriss
Little Delaware-Mission Creeks	Atchison, Brown, Jackson
Little Walnut-Hickory Creek	Butler, Greenwood
Middle Caney	Chautauqua, Elk
Muddy Creek	Butler, Cowley
Nebo Creek	Jackson, Atchison, Jefferson
North Otter Creek	Riley, Marshall, Washington
Rock Creek	Butler, Cowley
Silver Creek	Chase
Spillman Creek	Lincoln, Russell, Osborne, Mitchell
Spring Creek	Reno, Sedgwicke
Thompsonville	Jefferson
Timber Creek	Butler, Cowley
Turkey Creek	Dickinson, Marion
Twin Caney	Chautauqua, Elk, Montgomery
Upper Black Vermillion	Marshall, Nemaha, Pottawatomie
Upper Fall River	
Upper & Lower Wakarusa	Douglas, Osage, Shawnee, Wabaunsee
Upper Shunganunga	Shawnee
Upper Verdigris	Coffey, Greenwood, Lyon, Chase, Woodson

Table No. 2

Soil Conservation Service Projects
Reviewed by FHS, Region VI
(cont'd)

WATERSHED PROJECT	COUNTIES
Missouri	
Bear Creek	Scotland, Clark
Big Creek	Harrison
Blackwater	Johnson
Callahan Creek	Boone
Grindstone-Lost-Muddy Creek	DeKalb, Gentry, Daviess
Hoover-Frankum	Nodaway
Logan Creek	Reynolds
Loutre Township	Montgomery
102 River	Nodaway
Panther Creek	Harrison
Platte River & Tabo Creek	Lafayette, Worth
Wellington-Napoleon	Lafayette

Table No. 2

Soil Conservation Service Projects
Reviewed by PHS, Region VI
(cont'd)

WATERSHED PROJECT	COUNTIES
Nebraska	
Antelope Creek	Sheridan, Cherry
Bear-Pierce-Cedar Creek	Gage
Bellwood	Butler
Big Indian Creek	Jefferson, Gage
Bowman-Spring Branch	Thayer
Buckley Creek	Jefferson, Thayer
Cottonwood Creek	Saunders
Cub Creek	Gage, Jefferson
Dorchester	Saline
Dry Creek	Red Willow
Gering Valley	Scotts Bluff
Jones Creek	Polk
Mission Creek	Pawnee, Gage (& Marshall, Kansas)
Mud Creek	Gage
Papillion Creek	Washington, Douglas, Sarpy
Pilger	Stanton
Plattsmouth	Cass
Plum Creek	Gage, Pawnee
Rock Creek	Cuming, Stanton, Pawnee
Salt Creek	Butler, Lancaster, Seward, Saunders
Soap Creek	Gage
Spring Creek	Johnson, Otoe, Nemaha
Turtle, Jones & Cure	Sarpy
Upper Big Nemaha	Gage, Johnson, Lancaster, Otoe
Walnut Creek	Richardson
West Ulysses	Butler
Wilson	Cass, Otoe
Wildhorse	Morrill
Ziegler Creek	Otoe

Nebraska (cont'd)

Walnut Creek	Brown
Walnut-Brush-Little Slough	Atchison, Jefferson
White Clay-Brewery-Whiskey Creeks	Atchison

III WATER QUALITY AND BASIC DATA

INTRODUCTION

Providing the information necessary to assess and evaluate the significant problems associated with water supply and water pollution control is a vital function. With reliable sources of information, there is sound basis on which to form the serious and far-reaching decisions involved in sound water quality management. Certainly, it would be difficult, if not impossible, to measure progress where no baseline for comparability would be present. A basis on which to judge forms an all-important foundation in the responsibility of planning, organizing, managing and controlling a water quality program. In addition, if basic data are to be useful they must be accurate, complete, and comparable over a period of time.

NEED

It might be fairly stated that never before has our need to know been so great. Not long ago, prior to the rapid and complex industrialization of the past two decades, conventional sewage treatment through its bio-chemical processes was thought to produce a reasonably good effluent. This was generally so in spite of the many variables that a municipal and, or oxygen consuming waste might possess.

This situation has changed considerably with many new and exotic wastes exerting their influence on the water environment for the first time. Many of these new wastes, coming as the result of rapid technological change, do not respond to conventional treatment procedures. The natural purification processes of the stream often are to no avail. This is notable in the instance of synthetic detergents, now notorious for their reluctance to "degrade." Agricultural pesticides, petro-chemicals and radioactive materials are other substances finding their way to watercourses and thus presenting serious pollution problems requiring new forms of treatment. With expanding demands for water coming at an accelerated pace, it is becoming even more imperative to know these contaminants and how they influence the water environment. This also points up a need for better ways to measure and identify such substances.

The Basic Data program is therefore designed to assemble, examine, and interpret the facts needed by water pollution control authorities and thereby provide the basis for decision making.

Information gathering and interpretation cover a broad range of subjects such as inventories on municipal water supply and waste treatment facilities and industrial wastes, inventories on waste disposal practices at Federal Installations, plus other selected inventories, tabulation of construction contract awards of sewage and waterworks, and the operation of sampling stations for the acquisition of water data required by the specialized operating requirements of the Department

In contrast to the municipal facilities inventories there are little or no industrial wastes inventory data on file in sufficient detail to provide a more complete and accurate picture of existing and potential problems involving industrial pollution. There is no doubt as to the need for the collection of this information.

WATER QUALITY

The Federal Water Pollution Control Act (Public Law 660, 84th Congress) as amended by Public Law 87-88, approved July 20, 1961, authorizes and directs the Department of Health, Education and Welfare to collect and disseminate basic data on water quality relative to water pollution. This responsibility has been delegated to the Public Health Service.

Basic data on water quality as related to water supply and water pollution control are collected and disseminated by the Public Health Service in cooperation with other Federal, State and local agencies having related responsibilities and with industries and privately-owned utilities. The Water Pollution Surveillance System was established by the Public Health Service in 1957 for the purpose of carrying out these responsibilities. This program is concerned with data on the radiological, biological, chemical and physical quality of the major surface waters.

There are 128 Water Pollution Surveillance System sampling stations located throughout the United States, with 12 of these stations located in the States of Iowa, Kansas, Missouri and Nebraska as follows:

RIVER	STATION
Arkansas River	Near Coolidge, Kansas
Kansas River	Near DeSoto, Kansas
North Platte River	Near Henry, Nebraska
Platte River	Near Plattsmouth, Nebraska
Mississippi River	Burlington, Iowa
Mississippi River	Cape Girardeau, Missouri
Mississippi River	Dubuque, Iowa
Missouri River	Kansas City, Kansas
Missouri River	Missouri City, Missouri
Missouri River	Omaha, Nebraska
Missouri River	St. Joseph, Missouri
Missouri River	St. Louis, Missouri

Since 1957 and through 1962, the expansion of the Water Pollution Surveillance System was at an average rate of 30-40 new sampling stations each year. Since this is a long-range program, it is planned for continued expansion until approximately 300 stations have been located and placed in operation. Such expansion, by necessity, will depend upon the amount of funds made available to this program for expansion, operation and maintenance of the system. There are approximately as many desirable locations for future additional stations within the States of Iowa, Kansas, Missouri and Nebraska as now exists. Funds during Fiscal Years 1963 and 1964 did not permit the planned expansion of new stations.

As previously indicated, a major purpose of the Basic Data program is securing basic data for measurement of long-term trends. These data provide information pertaining to the effects of changes in water use and development of water quality at key points in river systems. It also provides continuous data on the nature and extent of pollutants affecting water quality and information which is useful in the development of comprehensive water resources programs. It is helpful to the State, interstate and other agencies in their water pollution control programs and in the selection of sources for multiple water uses.

A compilation of all data is published annually; five volumes have already been published. A sixth volume covering the water year October 1, 1962-September 30, 1963 is in the process of printing. In Appendix B is a compilation of these Water Quality data for the water year 1962-1963 and for the first six months of the water year 1963-1964.

INVENTORIES

Inventories form a useful and significant reservoir of information in formulating sound water quality policies. Water supply inventories provide data on the history and present use of surface and ground waters for domestic, municipal, industrial, agricultural, power, navigation and other purposes. They inventory the amount of water used, location of withdrawals and uses, water supply systems, and treatment facilities. By combining these data with that on various demographic and economic studies, it is possible to project future water supply requirements and to an extent to forecast just where these needs will lie. In this manner such data fill a vital need.

Waste facilities inventories record necessary information on the location, kinds, amounts and characteristics of sources of pollution, including combined sewer overflows; and municipal sewer systems and waste treatment facilities. These data, combined with those from other studies, provide the basis for estimating future pollution loads where those loads will be exerted, and their potential effect on water quality.

The Public Health Service maintains inventories of Municipal Water and Waste Facilities which are revised and updated at periodic intervals. During Fiscal Year 1963 copies of the "Municipal Water Facilities Inventory-1962" were received and distributed. Field data for updating the "Municipal Water Facilities Inventory" were collected during 1963. This information is currently at the printers and will reflect the conditions as of January 1, 1963. Planning is underway for the collection of field data for a complete "Industrial Waste Inventory" which is to be published as a separate inventory. A start on this inventory awaits funding and the necessary forms for the collection of the field data for this inventory. The State Water Pollution Control agencies in the Missouri Basin States have agreed to do a major portion of the field work which will be required.

In Appendix B statistical summaries of these most recent data are compared with data obtained in the earlier surveys for the States of Iowa, Kansas, Missouri and Nebraska. Also in Appendix B is the information collected for the 1962 Municipal Waste Facilities and the 1963 Municipal Water Facilities inventories.

Technical assistance to State and Federal agencies on problems of water quality is authorized by the Federal Water Pollution Control Act. Continuing studies are in progress in such fields as quality control of potable water supplies, re-evaluation of drinking water standards, conservation and improvement of water quality. Problems of toxicity from insecticides, herbicides, and other chemicals reaching water supplies through sewage and/or industrial waste and surface wash are also problems being investigated by the Public Health Service.

Research activities of the Public Health Service in Water Supply and Pollution Control fields are presently carried out at the Public Health Service Sanitary Engineering Center located in Cincinnati, Ohio, and are geared to problems caused by increase in pollution and industrial production and by changes in the technological developments.

POLLUTION-CAUSED FISH KILLS

In early 1960, the Surgeon General of the Public Health Service asked all State Conservation and Fish and Game agencies to report instances of fish kills attributable to pollutants entering the streams or lakes of the nation. In Appendix B is a pollution-caused fish kill summary for the States of Iowa, Kansas, Missouri and Nebraska for the years 1960, 1961 and 1962.

SEWAGE TREATMENT

Progress in the construction of sewage treatment facilities in the States of Iowa, Kansas, Missouri and Nebraska has been noteworthy. The number of communities treating sewage continues to increase with a 23 percent gain in the 1957-62 period. This increase resulted in a 42 percent rise in the population served by sewage treatment. Of further interest is the fact that approximately 63 percent of the estimated sewered population in 1962 was served by treatment as compared to less than 52 percent in the 1950 and 1957 data. This improvement came in spite of increases in the population served by sewers and no doubt much of this increase in treatment reflects the impact of the Federal Water Pollution Control Act. Such changes indicate clearly the forceful effects of this legislation as a stimulant in the control of water pollution. This in turn has resulted in a decrease in the number of communities not treating their wastes. From a total of 306 in 1957, the number of communities not treating their wastes has declined to 254 in 1962, whereas overall, the number of communities with sewer systems increased from 1247 in 1957 to 1539 in 1962.

The changes referred to in the previous paragraph could not have been brought about without the expenditure of large sums of money. The following table presents information on annual Contract Awards for Sewage treatment works in the 1952-62 period.

TOTAL CONTRACT AWARDS FOR SEWAGE TREATMENT WORKS

	IOWA	KANSAS	MISSOURI	NEBRASKA
1952	1,057,695	1,692,824	1,359,505	746,895
1953	1,388,165	4,025,380	2,172,363	168,652
1954	4,784,153	4,327,500	3,644,757	151,191
1955	984,026	1,713,573	471,365	103,942

TOTAL CONTRACT AWARDS FOR SEWAGE TREATMENT WORKS

	IOWA	KANSAS	MISSOURI	NEBRASKA
1956	932,197	4,513,773	1,912,051	321,164
1957	5,025,106	7,782,822	4,130,374	1,161,518
1958	5,450,140	5,899,942	5,947,762	5,219,046
1959	11,693,257	12,542,293	24,597,669	6,600,688
1960	12,949,778	16,446,119	19,999,430	11,244,041
1961	12,472,399	5,918,612	10,146,324	10,380,901
1962	5,097,427	3,601,037	8,529,926	9,428,656

IV. CONSTRUCTION GRANTS

SUMMARY

The Construction Grants Program under Public Law 660 was initiated July 31, 1956. This Summary includes the four states of Iowa, Kansas, Missouri and Nebraska. The Public Health Office, Region VI, located in Kansas City, Missouri is responsible for administering the Construction Grants Program.

Tables referred to in this Summary may be found in Volume III, Section C of the Statement Water Pollution Control and Quality Management Programs for Iowa, Kansas, Missouri and Nebraska.

A total of 376 projects for sewage treatment facilities have been completed with Federal assistance in these four states. Eligible costs were $58,952,850 of which grant participation was $15,549,594. A population of 2,651,703 was served by these projects (Tables I and IV).

Projects now active in these four states total 247, of which 44 are projects receiving aid under the Accelerated Public Works Program. Federal grants of 18.6 million dollars have stimulated construction projects of over 90 million dollars. This illustrates a ratio of 4 million dollars of construction project costs for every 1 million dollars of grant funds (Tables II and V).

In addition to completed projects and those now active, there is a backlog of 161 projects representing estimated costs of $141,450,621 for which Federal grant funds requests are estimated to be $16,290,807. It is also estimated that these projects will serve a population of 2,399,192.

STATUS OF PROGRAM

To date, the four states of Iowa, Kansas, Missouri and Nebraska have used all of the Federal monies that have been available to them.

In the fiscal years 1957 through 1961, $16,869,075 was used in these four states. In fiscal year 1962, $5,363,864 was expended. In fiscal year 1963, $6,214,561 was expended and in fiscal year 1964, it is anticipated grant funds will amount to $6,323,750.

As Tables III and VI so indicate, there still remains a sufficient backlog of projects to more than utilize the amount of Public Law 660 funds for fiscal year 1965.

V. ENFORCEMENT

The Missouri River has been the dominant physical characteristic in the development of the civilization in the 10 Missouri Basin States -- Montana, Wyoming, Colorado, North Dakota, South Dakota, Nebraska, Kansas, Minnesota, Iowa and Missouri. Since the Basin was first visited by the white man in 1540, the River has provided the focal point of mans endeavors.

In the beginning, trading posts, transportation stations, etc., were set up along this path through the wilderness. These outposts developed into our first municipalities which in turn stimulated ever increasing traffic on the River. During the 19th Century the River became the first artery of commerce. Steamboats traversed practically the entire length of the River carrying both merchandise and passengers. This route was devoid of many of the pitfalls and hardships facing covered wagon trains spreading ever westward. In the course of serving as a convenient transportation route, it opened large areas of the midwest to colonization. As would be expected the four Lower Basin States, Nebraska, Kansas, Iowa and Missouri, were the first to begin developing municipalities and agricultural enterprises.

Since the beginning of time, the history of man is closely associated with flowing streams. As civilization developed, flowing streams served many purposes -- a source of food, a means of transportation, domestic water supply, a method of disposing of wastes, recreation, etc. The tremendous size of the River and the volume of water carried seemed to be indestructible. For some 400 years the communities and industries developing along the lower Missouri River wantonly discharged all types of wastes to the River without realizing the degradation occurring in the River.

The first recognition of pollution in the Missouri River is published in a 1913 report entitled "Sewage Pollution of Interstate and International Waters -- the Missouri River from Sioux City to its Mouth" by PHS Scientist Dr. Alan J. McLaughlin. At that early date it is quite likely that this report was very controversial. The large cities along this reach of the River were undergoing rapid population and industrial expansion and thoughts concerning the indestructibility of the River must have been prevalent.

Further interest in the condition of waters of the lower reach of the Missouri River did not develop until the post-World War II era. In the middle and late 1940's scientists, and Public Health people began to recognize the highly polluted conditions existing in the River. Not only was the River serving as a method of disposing untreated wastes, it was also providing drinking water for approximately 25% of the people living in the lower Basin States. Commercial fishermen, water sports enthusiasts and conservationists were recognizing the impact of pollution on the stream. Below the large metropolitan areas fish were inedible, floating and suspended debris carried many miles downstream from the municipalities, oil spills to the River were frequent, garbage and refuse dumps were frequently located on the banks of the River, etc.

The Federal Water Pollution Act, PL 845, passed by the 80th Congress in June 1948, reflected the beginning of a radical change in public opinion

concerning water pollution control needs in the rivers of the nation. Among other requirements this Act directed the Surgeon General of the Public Health Service to cooperate with other Federal, State, and interstate Agencies and with municipalities and industries in the preparation and adoption of comprehensive programs for controlling pollution of interstate waters and tributaries thereof. In the development of these programs, consideration was to be given to the conservation of the nation's water for public water supplies, propagation of fish and aquatic life, recreational purposes, and agricultural, industrial and other legitimate uses. In cooperation with the Missouri Basin States, the Public Health Service developed "A Comprehensive Program for Control of Water Pollution"[1/], in the Missouri Drainage Basin. This report enumerated sources of pollution reaching the River, both domestic and industrial, and set forth recommendations for controlling pollution in the stream.

Prior to establishing a program for pollution abatement, it was necessary for the Missouri Basin State Water Pollution Control agencies and the Public Health Service to agree upon water quality objectives for the Basin. While interest had been expressed by certain minority groups concerning the need for pollution abatement action, the layman was not cognizant of the degree of pollution in the River. The State Sanitary Engineers and the Public Health Service however adopted a far-sighted and revolutionary document, 1/7/54, entitled "Water Quality Objectives". (Appendix D-1). Even at this late date, the State Sanitary Engineers and the Public Health Service were severely criticized by recognized experts in the water pollution control field. These experts stated that the need for treating wastes entering the Missouri River had not been shown and that the tremendous quantities of dilution water carried by the stream, rapid self-purification characteristics, modern water treatment facilities, etc, were adequately handling wastes entering the stream. While the issue was not publicized, the Missouri Basin State Sanitary Engineers and the Public Health Service experienced some difficulties in developing these modernistic water quality objectives. Had the layman been brought into the discussion of these objectives at that time there is doubt that he would have supported the need for waste treatment.

Following the publication of the Comprehensive Program for Control of Water Pollution, a public awareness program was initiated and stimulated by the Public Health Service. The States began activities directed toward complying with the water quality objectives.

Metropolitan areas on the lower Missouri River were reluctant to proceed with the construction of pollution control facilities. The cities had always discharged their wastes to the river and construction of waste treatment facilities was an expense which in the minds of city officials was not justified. A good portion of the lower reach of the Missouri River in the four lower Basin States is interstate. This further complicated the problem of controlling wastes discharged to the stream. Municipalities located along the stream were very reluctant to proceed with waste treatment facilities without assurance that like action would be taken in an adjoining State. There were no mechanics for the States to attack this problem simultaneously.

With the Amendment to the Federal Water Pollution Act in 1956, and later in 1961, the Public Health Service was in a position to stimulate unified action among the States in abating pollution in the lower Missouri River.

The first Federal water pollution control enforcement action in the Missouri River Basin and the second such action in the nation was a conference in the matter of pollution of interstate waters of the Big Blue River (Nebraska-Kansas). This conference was held on May 3, 1957 at the request of the Water Pollution Control agencies of Nebraska and Kansas, at Beatrice, Nebraska with conferees representing Nebraska and Kansas, and the Public Health Service. Following a presentation of statements pertaining to pollution of the interstate waters in question and discussion of the various aspects of the problem, the conferees unanimously reached the following general conclusions and recommendations (Appendix D-3):

1. That pollution of the interstate waters of the Big Blue River was occurring and that abatement of this pollution was subject to action by the Federal Water Pollution Control Act.

2. The major causes of pollution of the Big Blue River was the discharge of untreated sewage from Beatrice and that other communities in Nebraska were contributing to interstate pollution.

3. That measures presently used for disposal of sewage from these communities were inadequate.

4. That pollution abatement facilities should be constructed and placed in operation according to a time schedule developed by the conferees.

5. That the Nebraska State Department of Health make periodic progress reports to the other conferees.

All sources of waste in the reach of the River are now receiving treatment. An estimated 2-million dollars, of which approximately $550,000 were Federal grants, has been spent in providing treatment by the municipalities. Current plans have been made for a resurvey of the interstate reach of the stream to determine the quality of water now carried by the Big Blue River. This procedure will afford an opportunity to evaluate the efficiency of waste treatment and to determine whether or not such facilities are adequate.

At the request of the States of Kansas and Missouri and on the basis of reports, surveys, and studies, the Surgeon General of the Public Health Service believed that pollution of the Missouri River caused by discharges of untreated sewage and industrial wastes in the St. Joseph, Missouri area was endangering the health and welfare of persons in Kansas. In accordance with the provisions of the Federal Water Pollution Act, PL 660, a conference was held on June 11, 1957[2/] at St. Joseph, Missouri. The conferees were representatives of the State Water Pollution Control agencies of Missouri and Kansas, and the Public Health Service. In view of statements and discussions which followed, the conferees unanimously made the following general recommendations and conclusions (Appendix D-22):

1. That pollution of interstate waters subject to abatement under the

Federal Water Pollution Control Act was occurring in the Missouri River as a result of improperly treated sewage and industrial wastes from St. Joseph and its associated stockyards district. Such discharges were endangering the health and welfare of persons in Kansas, a State other than which the discharges originated.

2. That the untreated wastes were contributing to the degradation of the quality of the water in the River which interfered with legitimate water usages.

3. That the City of St. Joseph and the industries of its associated stockyards district provide adequate waste treatment facilities in accordance with a time schedule proposed by the conferees.

4. That the Missouri Division of Health report to the other conferees periodically as to the progress being made in the construction of pollution abatement facilities in accordance with the proposed time schedule.

The City of St. Joseph, Missouri failed to make satisfactory progress in pollution abatement and in accordance with the Federal Water Pollution Control Act was notified by the Secretary of the Department of Health, Education, and Welfare to appear before a Hearing Board as provided in the Act. The hearing which was held July 27-30, 1959 at St. Joseph[37] was convened and conducted in accordance with the provisions of the Act. The Findings, Conclusions and Recommendations of the Hearing Board concurred with the recommendations of the conferees and the Secretary, Department of Health, Education, and Welfare in a notice (Appendix D-29) notified the polluters to proceed with the construction of abatement facilities by June 1, 1963, in accordance with a time schedule recommended by the Hearing Board. (Appendix D-32).

St. Joseph, Missouri did not make suitable progress in maintaining the schedule as notified by the Secretary, and the Secretary was asked by the Water Pollution Control agencies of Kansas and Missouri to proceed under the Enforcement Section of the Federal Water Pollution Control Act against the City of St. Joseph, Missouri. Accordingly, the case was filed on September 29, 1960 by the Department of Justice (Appendix D-40) in the Western U. S. District Court for the Western District of Missouri, St. Joseph Division, between U. S. of America, plaintiff, and the City of St. Joseph, Missouri, defendent.

In preparation for hearing this case the Honorable Richard M. Duncan, District Judge of the Western District, held a Procedural Conference (Appendix D-48) at his court rooms in St. Joseph, Missouri on Friday, November 18, 1960.

The citizens of St. Joseph passed a bond issue on April 11, 1961 in the amount of $9,605,000 for the purpose of constructing a sewage treatment plant and the necessary interceptor sewers. This action resulted in deferment of Federal court proceedings; however the U. S. District Court Judge has retained jurisdiction of the case until pollution has been abated.

The St. Joseph, Missouri industrial complex has completed and is now

operating waste treatment facilities. The City of St. Joseph is making progress in the construction of abatement facilities. This progress is expected to be acceptable to the U. S. Department of Justice.

On the basis of reports, surveys, and studies the Surgeon General had reason to believe that the Missouri River was being polluted by untreated sewage and industrial wastes from Omaha, Nebraska; Council Bluffs, Iowa; and other cities in the area and that such pollution was endangering the health and welfare of persons in states other than which the discharge originated. In accordance with provisions of the Federal Water Pollution Control Act, and at the request of the States, a conference in the matter of pollution of the interstate waters of the Missouri River, Omaha, Nebraska area (Nebraska-Iowa-Missouri-Kansas) was held June 14, 1957[4/] at Omaha. Conferees participating in the conference were representatives of the States of Iowa, Kansas, Missouri and Nebraska, and the Public Health Service. In view of statements presented and discussion, the conferees unanimously made the following general conclusions and recommendations (Appendix D-78):

1. That pollution of the interstate reach of the River subject to abatement under the Act was occurring and that such discharges endangered the health and welfare of persons in States other than that in which the discharge originated.

2. That the main source of such pollution was Omaha, Nebraska.

3. That this pollution was causing degradation of the quality of the water in the stream and interfering with legitimate water uses.

4. That Omaha, Nebraska; Council Bluffs, Iowa, and other cities in the area should provide adequate waste treatment facilities in accordance with a schedule developed by the conferees.

All municipalities in the area have completed waste treatment facilities and placed them in operation. Industrial wastes generated by the packing industry in Omaha are at the present time the subject of some discussion concerning the method of treatment which must be provided for these wastes. They are presently being discharged to the Missouri River without treatment.

The Public Health Service Regional Office has recommended another session of the Omaha conference to establish plans and alternatives for the solution of this problem.

At the request of the States of Kansas and Missouri, and on the basis of reports, surveys, and studies, the Surgeon General had reason to believe that pollution of the Missouri River was being caused by untreated sewage and industrial wastes from the City of Kansas City, Kansas; Kansas City, Missouri; and North Kansas City, Missouri and that this pollution was subject to abatement under the Federal Water Pollution Control Act. A conference on the matter of pollution of the interstate waters of the Missouri River - Kansas Citys Metropolitan Area (Kansas-Missouri) was held December 3, 1957[5/] at Kansas City, Missouri. The conferees were representatives of the State Water Pollution Control agencies of Kansas and Missouri, and the Public Health Service. In view of the conference discussion, the conferees unanimously made the following general recommendations and conclusions (Appendix

D-83).

1. That pollution of the interstate waters of the Missouri River, Kansas Citys area, was occurring and that the major sources of such pollution were untreated and inadequately treated sewage and industrial wastes from the metropolitan area.

2. That this pollution was contributing to the degradation of the Missouri River and interfering with downstream water usages.

3. That Kansas City, Kansas; Kansas City, Missouri; North Kansas City, Missouri; and industries in the metropolitan area should provide adequate treatment for wastes prior to their discharge to the River in accordance with a schedule developed by the conferees.

4. That the Kansas State Board of Health and the Missouri Division of Health should report to the other conferees periodically as to progress being made in the construction of abatement facilities.

Since satisfactory compliance with the recommendations of the conferees was not made in the Kansas Citys Metropolitan Area, a hearing in the matter of pollution of the interstate reach of the River under consideration was called by the Secretary of the Department of Health, Education, and Welfare in accordance with the provisions of the Federal Water Pollution Control Act. The Hearing was held June 13-17, 1960 at Kansas City, Missouri[6/]. The Hearing Board in its Findings, Conclusions and Recommendations concurred with the recommendations of the conferees and the Secretary of the Department of Health, Education, and Welfare notified the polluters (Appendix D-91) to proceed with pollution abatement facilities in accordance with the schedule recommended by the Hearing Board (Appendix D-94).

The citizens of Kansas City, Missouri passed a bond issue in the amount of $75 million in November 1960; Kansas City, Kansas passed a bond issue of $15 million in November 1960; and North Kansas City, Missouri passed a bond issue of $7,443,000 in November 1960. Following this provision for financing the construction of waste treatment facilities, suitable progress has been made by the three municipalities.

At the request of the States of Missouri and Illinois and on the basis of reports, surveys, and studies, the Surgeon General had reason to believe that pollution of the Mississippi River was caused by the discharge of untreated sewage and industrial wastes in the St. Louis, Missouri metropolitan area and that such pollution was endangering the health and welfare of persons in States other than which the discharge originated. A conference in the matter of pollution of the Mississippi River, St. Louis Metropolitan Area (Illinois-Missouri) under provisions of the Federal Water Pollution Act was held March 4, 1958[7/]. (A relatively small portion of the wastes generated in the area discharge to the Missouri River). Conferees representing the State Water Pollution Control agencies of Illinois and Missouri, Bi-State Development Agency, and the Public Health Service participated in the conference. In view of the discussion and statements presented at the conference, the conferees unanimously made the following general conclusions and recommendations (Appendix D-105):

1. That pollution of interstate waters of the Mississippi River, St. Louis Metropolitan Area, was occurring and that such pollution also caused degradation of the stream which interfered with downstream water usages.

2. The conferees developed a schedule for constructing remedial facilities and for inaugurating other pollution control measures.

3. The Illinois State Water Pollution Board and the Missouri Division of Health were to report to the other conferees periodically as to progress being made in the area.

The sources of pollution discharging to the Missouri River are located in the Coldwater Creek watershed. A bond issue in the amount of $10,986,000 was passed by the citizens of the area in 1960. The construction of waste treatment facilities and necessary interceptor sewers is now under construction.

The Metropolitan St. Louis Sewer District voters also passed a bond election for an issue of $95 million to finance waste disposal works on the Mississippi River.

In accordance with the request of the States and on the basis of reports, surveys, and studies, the Surgeon General called a conference in the matter of pollution of interstate waters of the Missouri River in the Sioux City area (covering discharges between Gavins Point Dam, South Dakota, and Omaha, Nebraska) under provisions of the Federal Water Pollution Control Act. The conference was held July 24, 1958[8/] at Sioux City, Iowa. Conferees participating in the conference were representatives of the State Water Pollution Control agencies of Iowa, Kansas, Missouri, Nebraska, and South Dakota, and the Public Health Service. In view of the statements presented and of conference discussion, the conferees unanimously made the following general conclusions and recommendations (Appendix D-112):

1. That pollution of the interstate waters of the Missouri River was being caused by discharges from municipalities and industries between Gavins Point Dam, South Dakota and Omaha, Nebraska and that this pollution was subject to abatement under the provisions of PL 660.

2. That such pollution was contributing to the degradation of the reach of the stream under consideration and interfering with downstream legitimate water usages.

3. That pollution be abated in accordance with a schedule agreed upon by the conferees and that each State Water Pollution Control agency report to the Public Health Service periodically as to progress being made by its cities and industries in abating pollution.

4. That there were numerous sources of pollution along this reach of the River, but that Sioux City, Iowa was the major contributor.

The failure of Sioux City, Iowa to make suitable progress in providing abatement facilities resulted in the calling of a hearing [9/] by the Secretary of the Department of Health, Education, and Welfare in accordance with the

provisions of the Federal Water Pollution Control Act. The Board, in its Findings, Conclusions, and Recommendations (Appendix D-119) found that the City of Sioux City, Iowa and several firms in the area should be required to cease and desist from discharging improperly treated wastes to the Missouri River in accordance with a time schedule developed by the Board. The Secretary of the Department of Health, Education, and Welfare found that compliance with the proposed Board schedule was reasonable and notified the pollutors to proceed with providing waste treatment facilities by notice dated April 7, 1959 (Appendix D-127).

The City Council of Sioux City, Iowa authorized a bond issue in the amount of $7,500,000 in 1961 for financing the construction of waste treatment facilities and the necessary interceptor system. The interceptor is essentially complete and the waste treatment plant was placed in operation April 1, 1964.

In accordance with the request of the Water Pollution Control agencies of the States of Wyoming and Nebraska, the Secretary of the Department of Health, Education, and Welfare called a conference[10/] in the matter of pollution of the interstate waters of the North Platte River (Wyoming-Nebraska) under the provisions of the Federal Water Pollution Control Act. The first session of this enforcement action was held September 21, 1961 at Scottsbluff, Nebraska. Conferees participating in the conference were representatives of the Water Pollution Control agencies of Wyoming and Nebraska, and the Public Health Service. In view of the statements presented and of conference discussion, the conferees made the following conclusions and recommendations (Appendix D-129):

1. That pollution of the interstate waters of the North Platte River was being caused by discharges of industrial wastes, that such pollution was contributing to the degradation of the reach of the stream under consideration, and interfering with downstream legitimate water uses, and further that this pollution was subject to abatement under the provisions of the Federal Water Pollution Control Act.

2. That adequate waste treatment facilities be installed in Wyoming to abate pollution of the river as it crosses State line and that Nebraska sources of pollution in the area under consideration also provide adequate waste treatment facilities.

3. That the Public Health Service, in cooperation with the State Water Pollution Control agencies, municipalities and industries involved, conduct an investigation and study of the River during the 1961-1962 sugar beet campaign to determine specific levels of pollution and that after the completion of the investigation and study the conference be reconvened to consider the results obtained and to agree on action to be taken to abate pollution of the North Platte River.

The second session of the conference was convened at Cheyenne, Wyoming on March 21, 1962. In light of conference discussions and reports, the following conclusions were reached and recommendations made (Appendix D-136):

1. That adequate waste treatment facilities be installed in Wyoming

to abate pollution of the River as it crosses State line.

2. That installation of adequate waste treatment facilities be provided for wastes being discharged to the River from Nebraska.

3. That the primary sources of industrial pollution in Wyoming provide remedial facilities to be in operation by the beginning of the 1962-1963 operational program.

4. That the Nebraska Department of Health provide a voluntary effective program to control pollution in Nebraska.

5. That a program for sampling, analyzing and monitoring the effects of discharges from industrial sources on the River be established and in operation by the beginning of the 1962-1963 sugar beet campaign.

6. That at the end of the 1962-1963 sugar beet campaign all parties concerned will evaluate the accomplishment and effectiveness of the program agreed upon with a view of determining the need for another session of the conference.

Following the evaluation of the effects of the municipal and industrial waste treatment facilities in use during the 1962-1963 sugar beet campaign, the States of Wyoming and Nebraska requested a third session of the conference. This session was held November 20, 1963 at Scottsbluff, Nebraska[11/]. The summary of this session of the conference has not been published. However, it appears that the States of Nebraska and Wyoming must now decide whether the North Platte River below Torrington, Wyoming and downstream to Lake McConaughy should be restored and maintained as a fisheries resource.

All metropolitan areas along the interstate portion of the Missouri River from Sioux City, Iowa to the Mouth have been the subject of Federal enforcement action under the Federal Water Pollution Control Act. The Act provides for a conference, followed by a hearing if necessary, and if further action is needed, the matter is submitted to the Department of Justice for appropriate court action. This reach of the Missouri River has been the scene of all phases of action prescribed by the Federal Water Pollution Control Act.

Aggressive action has been taken by the State Water Pollution Control agencies of Nebraska, Kansas, Iowa, and Missouri, and the Public Health Service in initiating and conducting a rigorous water pollution control program. Along the 760 mile stretch from Sioux City, Iowa to the Mouth of the Missouri River all sources of pollution are in some state of providing treatment facilities. Sioux City has completed waste treatment facilities and placed them in operation. Omaha has completed the construction of its sewage treatment plant and is treating a large portion of its domestic waste. Council Bluffs completed its sewage treatment plant and placed it in operation in 1963. St. Joseph has let a contract for the construction of a treatment plant and the St. Joseph Industrial Complex is now operating a waste treatment plant. Rapid progress is being made in providing waste treatment in the Kansas Citys Metropolitan Area, the Coldwater Treatment Plant in Metropolitan St. Louis is under construction. Action by the State Water

Pollution Control agencies has resulted in progress by other municipalities along this reach of the River.

The 1961 Amendment to the Federal Water Pollution Control Act strengthened the position of the Public Health Service in the field of water pollution control and authorized substantially greater funds for the construction grants waste treatment program. This Amendment was adopted during the period of heavy construction in the lower Missouri River Basin and has substantially contributed to the successful water pollution abatement program along the River. The target date for placing all waste treatment plants along the River in operation is 1967. One of the most important factors in this very successful water pollution abatement program has been close cooperation by the State Water Pollution Control agencies of Nebraska, Kansas, Iowa, and Missouri, and the Public Health Service. As a result of this unified action, an intensive public awareness, education program has been very successful in convincing the citizens of the four States of the need for protecting this life line of the Lower Basin -- The Missouri River.

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VI. FEDERAL INSTALLATIONS

With the passage of the Federal Water Pollution Control Act and subsequent amendments, the U. S. Public Health Service initiated a rigorous water pollution control program. This action culminated in enforcement actions in many areas of the country. In many such actions, it was brought to the attention of the Department of Health, Education, and Welfare representatives that Federal installations in the enforcement areas were discharging raw or inadequately treated domestic and/or industrial wastes to the water courses under consideration. Furthermore, Federal installations had in the past been the subject of serious complaints from citizens and various organizations and political subdivisions.

Authorization for the initiation of a program for abating and controling pollution at Federal installations rests in a letter of December 14, 1962, written by the late President John F. Kennedy to the Secretary of the Department of Health, Education, and Welfare. In this letter the President wrote:

> I share your concern over the fact that we do not have fully effective programs to control water pollution at all Federal installations. The Government should set an example in the abatement of water pollution, and I hope the deficiencies noted in your report will be corrected at the earliest possible time.
>
> I will look to you to take the lead in working with other officials of the executive branch in this matter. The departments and agencies are to cooperate fully with you in planning and carrying out needed improvements.

In accordance with this authorization, the Secretary of the Department of Health, Education, and Welfare implemented a pollution abatement program in July 1963 to be carried out by the Public Health Service. This program required the physical investigation and evaluation of wastes from all Federal installations that discharge treated or untreated wastes to either surface waters or the ground. Regional Water Supply and Pollution Control Program Directors of the Public Health Service were ordered to plan the mechanics of the program on the basis of information contained in the Inventory of Federal Installations Waste Disposal Practices compiled by the Department, with data current to December 31, 1960.

The Natural Resources and Power Subcommittee of the Committee on Government Operations, House of Representatives, sent a communication to the Departments and principal agencies of Government requesting specific information concerning waste disposal practices at "selected" installations under their respective jurisdiction. Since the Public Health Service was given the primary responsibility of evaluating waste disposal practices at Federal installations, the governmental departments and agencies having jurisdiction over field installations were advised to look to the Public Health Service for evaluation of the "selected" installations.

Regional Program Directors were ordered to initiate a program along

certain guide lines. The "selected" installations which were generally the largest contributors of pollution to the nation's water courses were given first priority. It was determined that a field investigation of each Federal installation would be made by an Engineer of the Enforcement Section, with such assistance rendered by other engineers of the program as possible. The surveys and investigations determined:

a. The adequacies of any treatment provided to control pollution of the receiving waters.

b. The remedial measures necessary to abate and control such pollution.

c. What current plans an installation has for installing the remedial measures determined by the Program Director to be required.

d. The status of any plans, e.g., completed design and specifications, availability of appropriations, dates for commencement and completion of construction, start of operation.

The Regional Program Director determined that a complete report of investigation should be written for each field investigation. Appropriate distribution was made and on the basis of the findings of the field investigation a return inspection was scheduled where necessary. Where the treatment provided was deemed inadequate either because of facilities or because of poor operation, a revisit to the installation was scheduled. Normally this revisit was to be made within six months from the date of the first investigation or as soon thereafter as possible. The purpose of the revisit was to determine what progress had been made in providing adequate waste treatment facilities.

Where treatment facilities were determined to be adequate a reinvestigation should be made on an annual basis to insure that proper operation of the facilities is provided.

There are many factors to be considered in providing adequate waste treatment facilities. Items such as soil conditions, population density, dilution water, temperature, rainfall, etc, must be considered in the design and operation of a system. It is therefore desirable to enlist the assistance of the State Water Pollution Control agencies who by statute have primary responsibility for water pollution control in their respective state. Where possible a representative of the appropriate State Water Pollution Control agency was invited to assist in waste disposal evaluation and requested to contribute information and data in the preparation of the report of investigation. This cooperative program has been most effective in the four States of the Lower Missouri River Basin.

The 1960 Inventory of Federal Installations (Appendix E) for the States of Iowa, Kansas, Missouri, and Nebraska listed 991 sources of wastes. Of this number 678 discharge wastes to another system, usually a municipal system. Of the remaining 313 installations, 67 come within the category of "selected" installations. Of these 67 installations, only four are discharging untreated wastes to the surface waters or the ground.

While first priority is being given to the "selected" installations, the investigating engineers are expected to plan travel as economically as possible and where convenient, investigate other installations enroute. A tabulation of all known "selected" installations in the four Lower Missouri River Basin States, showing the date of inspection and related information follows (page VI-4).

The results of field investigations to date reveal the need for and the importance of the program for abating and controlling pollution at Federal installations. As is noted above practically all of the installations have some form of waste treatment facilities. However in many instances these facilities are inadequate, in a poor state of repair, poorly operated, etc.

As of May 1, 1964, the evaluation of waste treatment facilities had been made at 66 Federal installations. These ranged in size from the very small to the large defense installations. Without exception, the cooperation of Governmental Departments and/or Agencies involved has been excellent. The Federal Waste Installation evaluation program will result in adequate waste disposal systems for all Federal installations as rapidly as the Congress makes funds for such construction, maintenance, and operation available to the agencies.

FEDERAL INSTALLATIONS

Systems which discharge each day 3,000 or more gallons of waste to surface or ground waters or non-waterborne wastes from 200 or more persons.

State of IOWA

As of May 1, 1964

Installation	Discharged to	Sewage gpd	Industrial Wastes, gpd	Date Inspected	Remarks
Dept. of Defense					
Army					
Iowa Ord. Plt. Div.A	Skunk R. Brush Cr.	84,000 394,490	500	4/64	Sanitary waste treatment adequate Ind. waste treatment requires further study.
NIKE Offutt AFB Site 10	Ground	4,194			
Air Force					
Waverly AFS	Ground	16,000			
Offutt AFB Missile Site 3	Ground	15,000			
Sioux City Air Base	Missouri R.	350,000		7/63	Treatment adequate
Dept. of Interior					
Fish & Wildlife Serv.					
Manchester Nat.Fish Hat.	Spring Br. Ground	1,100	1,600,000	4/64	Treatment adequate
Bureau of Indian Affairs					
Gr.Lakes Sac-Fox D Schl.	Ground	3,000			
Atomic Energy Comm.					
Iowa Ord. Plt.	Brush Creek		254,500	4/64	Sanitary waste treat.adequate; Ind. waste treat. req. further study
Veterans Administration					
V. A. Hospital	Des Moines R.	231,000			

FEDERAL INSTALLATIONS

Systems which discharge each day 3,000 or more gallons of waste to surface or ground waters or non-water borne wastes from 200 or more persons.

State of KANSAS — As of May 1, 1964

Installation	Discharged to	Sewage gpd	Industrial Wastes, gpd	Date Inspected	Remarks
Department of Defense					
Army					
Sunflower Ord. Wks.	Kill Cr. Ground	121,000 1,000	5,000	9/63	Treatment Adequate
Fort Riley	Kansas R. Ground	15,237,000 750P [1/]	97,000	10/63	Treatment Adequate
NIKE K.C. Site 60	Ground	5,360		3/64	Treatment adequate
Kansas Ord. Plt.	Labette Cr.	203,000		----	
Fort Leavenworth	Leavenworth sewer	1,626,100		1/64	Treatment adequate. Now discharges to municipal system
Air Force					
Schilling AFB	Dry Cr. Ground	586,820 525	128,460	10/63	Ind. Wastes req. treatment San. STP req. better Opr.
McConnell AFB	Big Ark. R. Ground	 250	25,000	1/64	Ind. Waste Treat. Fac. will be req.
A.F. Plt. #13	Ark. R.		401,500	1/64	Treatment adequate
Forbes AFB	Shunganunga Cr.	760,000		1/64	Treatment adequate

1/ P - non-waterborne wastes from (x) people.

FEDERAL INSTALLATIONS

Systems which discharge each day 3,000 or more gallons of waste to surface or ground waters or non-waterborne wastes from 200 or more persons.

State of KANSAS — As of May 1, 1964

Installation	Discharged to	Sewage gpd	Industrial Wastes, gpd	Date Inspected	Remarks
Dept. of Defense (cont'd)					
Navy					
Olathe NAS	Niles Cr. Ground	287,000 500	20,000	9/63	Treatment adequate
Corps of Engrs.					
Kanopolis Reservoir	Ground Ground	800 250P		8/63	Treatment adequate
Dept. of Interior					
Bureau of Mines					
Otis Helium Plant	Drainage course	15,800	41,100	4/64	Treatment adequate
Bureau of Indian Affairs					
Haskell Institute	Wakarusa R.	20,000		1/64	treatment adequate
Fish & Wildlife Serv.					
Farlington Nat. Fish Hatchery	Drywood Cr. Ground	500	36,205	10/63	Treatment adequate
Cedar Bluff Nat. Fish Hatchery	Smoky Hill R. Ground	500	2,500,000	10/63	Sanitary waste disposal system requires modification

FEDERAL INSTALLATIONS

Systems which discharge each day 3,000 or more gallons of waste to surface or ground waters or non-waterborne wastes from 200 or more persons.

State of MISSOURI — As of May 1, 1964

Installation	Discharged to	Sewage gpd	Industrial Wastes, gpd	Date Inspected	Remarks
Dept. of Defense					
Army					
NIKE K.C. Site 30	Ground	6,040		2/64	Treatment adequate
NIKE St.Louis Site 60-A	Meramec R.	6,000			
Fort Crowder	Buffalo Cr.	280,000	198,000		
Fort Leonard Wood	Dry Cr.	2,200,000		9/63	Treatment adequate
	Ground	28,350	19,600		
		2,808P[1/]			
NIKE K.C.Site 10	Ground	8,320		2/64	Treatment adequate
Air Force					
Kirksville AFS	Chariton R.	49,400			
	Ground	4,200			
Richards-Gebaur AFB	Little Blue R.	350,000	5,700	4/64	Final Chlorination was recom.
	Ground	1,800			
Whiteman AFB	Clear Fork Cr.	400,000		4/64	Treatment adequate
	Ground	25,000			
Rocketdyne AF Plt 65	Ground	12,000	95,000		
	Ground		10,000		
Navy					
Ind. Reserve Aircraft Plt (McDonnell Aircraft Corp)	Coldwater Cr.	490,000	1,940,000	10/63	Treatment adequate

1/ P - non-waterborne wastes from (x) people.

FEDERAL INSTALLATIONS

Systems which discharge each day 3,000 or more gallons of waste to surface or ground waters or non-waterborne wastes from 200 or more persons.

State of MISSOURI — As of May 1, 1964

Installation	Discharged to	Sewage gpd	Industrial Wastes, gpd	Date Inspected	Remarks
Dept. of Defense (cont'd)					
Corps of Eng Civil					
Gasconade Boat Yard	Missouri R.	7,400		8/63	Raw sewage to R; Treatment req.
Table Rock Res.	White R.		12,800,000	10/63	No treatment req.
Wappapello Res.					
Dam Site Area	Ground	3,750			
	Ground	50P			
Service Base	Mississippi R.	5,000		8/63	will be served by Met. St. Louis Sewer Dist.
Atomic Energy Comm.					
Bendix Plt.	Blue R.		954,000	1/64	Treatment adequate
Mallinckrodt Chem.Wks.	Missouri R.	110,000	2,830,000	1/64	Treatment adequate
Dept. of Interior					
National Park Serv.					
Geo Wash Carver NM	Ground	3,600		9/62	Treatment adequate
Fish & Wildlife Serv.					
Neosho Nat. Fish Hat.	Haerrells Br.		1,300,000	10/63	Treatment adequate
Veterans Administration					
V.A.Hospital (Jefferson Barracks)	Mississippi R.	200,000		8/63	will be served by Met. St. Louis Sewer Dist.

FEDERAL INSTALLATIONS

Systems which discharge each day 3,000 or more gallons of waste to surface or ground waters or non-waterborne wastes from 200 or more persons.

State of MISSOURI — As of May 1, 1964

Installation	Discharged to	Sewage gpd	Industrial Wastes, gpd	Date Inspected	Remarks
Treasury Department					
Coast Guard					
C.G. Base, St.Louis	Mississippi R.	3,000		1/64	Will be served by Met. St. Louis Sewer Dist.
General Services Admin.					
Mil.Pers.Rec. Center	Des Peres Cr.		4,800	1/64	Treatment adequate.

FEDERAL INSTALLATIONS

Systems which discharge each day 3,000 or more gallons of waste to surface or ground waters or non-waterborne wastes from 200 or more persons.

STATE OF NEBRASKA

As of May 1, 1964

Installation	Discharged to	Sewage gpd	Industrial Wastes, gpd	Date Inspected	Remarks
Dept. of Defense					
Army					
NIKE Offutt AFB Site 60	Ground	5,350			
Sioux Ord. Depot	Ground	312,265	100	4/64	Treatment adequate
NIKE Lincoln AFB Site 1	Ground	4,875			
NIKE Lincoln AFB Site 50	Ground	5,158			
Air Force					
Hooper Ionospheric Site	Ground	10,750			
Offutt AFB Comm.Annex 2	Ground	2,000			
Omaha AFS	Ground	18,000			
Offutt AFB-MSL SQ NC Fac	Ground	50,000			
Offutt AFB	Pappio Cr. Ground	1,000,000 1,500		10/63	Treatment adequate
Offutt AFB MSL Site 1	Ground	15,000			
Offutt AFB Mead Ord Plt.	Johnson Cr.	120,000			
Offutt AFB MSL Site 2	Ground	15,000			
Navy					
Ammunitions Depot	Big Sandy Cr.	20,400	97,000	10/63	Treatment adequate

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FEDERAL INSTALLATIONS

Systems which discharge each day 3,000 or more gallons of waste to surface or ground waters or non-waterborne wastes from 200 or more persons.

State of NEBRASKA — As of May 1, 1964.

Installation	Discharged to	Sewage gpd	Industrial Wastes, gpd	Date Inspected	Remarks
Dept. of Defense (cont'd)					
Corps of Eng Civil					
Harlan County Reservoir					
Admin.& Townsite Area	Ground	3,000		8/63	Treatment adequate
Patterson Harbor	Ground	200P[1/]		8/63	Treatment adequate
Gavins Pt.Dam & Res.					
Weigand Rec Area	Ground	600P		9/63	Treatment adequate
Rec Area (Niobrara)	Ground	300P		9/63	Treatment adequate
Santee Rec. Area	Ground	270P		9/63	Treatment adequate
South Shore Rec Area	Ground	2,000P		9/63	treatment adequate
Rec Area (GavinsPt)	Ground	2,000P		9/63	Treatment adequate
Dept. of Interior					
Fish & Wildlife Serv.					
Crawford Nat.Fish Hat.	White R. Ground	300	935,000	10/63	Treatment adequate
National Park Serv.					
Scottsbluff Nat. Mon.	Ground	3,000		6/63	Treatment adequate
Bureau of Indian Affairs					
Winnebago Agency	Br.of Omaha Cr.	8,000			

1/ P - non-waterborne wastes from (x) people.